

## A Functional Analysis of a Behavior Analyst's Functional Analysis

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The purpose of this paper is to provide a functional analysis of a behavior analyst's functional analysis. Specifically, it is a functional analysis of Leigland's (1989) functional analysis of the use of mentalistic terms by subjects who were instructed to observe and explain the behavior of a pigeon exposed to a fixed-interval (FI) reinforcement schedule. Having stated this purpose, one might reasonably ask, why do this? The question arises because, at least for radical behaviorists, a functional analysis of an event is an explanation of that event. Why, then, would it be useful, or even interesting, to provide a functional analysis of a functional analysis, or, an explanation of an explanation?

Three reasons are offered. First, it is clear that explanations, including functional analyses, are instances of verbal behavior. As such, they are under the control of certain variables, and to the extent that these variables can be identified, we can begin to explain our explanations. A functional analysis of the explanatory behavior of behavior analysts is necessary if we are to understand the conditions that give rise to the use of the term explanation and, hence, to understand its meaning. This is tantamount to saying that if, as scientists, we claim to have knowledge or an understanding of events, it is important to know the conditions under which we make these knowledge claims. This functional analysis of Leigland's verbal behavior, then, is nothing more than an account of the knowledge claim of a radical behaviorist.

The second reason occurred after reading Leigland's paper. His explanations are heavily laden with behavior analytic terms or jar-

gon. A functional analysis of his verbal behavior, then, ought to reveal the conditions under which behavior analytic terms are used and their meaning in everyday language.

Finally, this paper represents, to my knowledge, the first published application of the methodology developed by Willard Day and his colleagues at the University of Nevada, Reno. Although its rationale and procedures have been described in unpublished graduate student research and papers delivered at professional meetings (e.g., Bennett, 1988; Mascolo & Dougher, 1985; McCorkle, 1978; Spooner, 1981) they have not yet appeared in print. The method offers a unique approach to the functional analysis of verbal behavior and gets at the complex issue of stimulus control of verbal behavior which is often missed or perhaps inaccessible to an experimental analysis. It could be argued that its most appealing aspect is its promise as an empirical epistemology. The following, taken directly from a paper by Bennett (1988), is a particularly succinct and clear description of the general method.

In research of this type, the researcher transcribes interesting verbal material. The researcher then identifies, describes, and classifies aspects of the verbal material which have similar effects upon his or her behavior as a reader. In this way, classes of verbal behavior are identified. The researcher subsequently makes assessments regarding the variables which operate in the functional control of the verbal behavior by relating it to aspects of its historical and current environmental context. These assessments are seen to be directly under the control of the researcher's experience in observing behavior, repeated exposure to the data provided in the transcript, and professional training as a member of the scientific verbal community associated with the work of B. F. Skinner (p. 2).

In line with Bennett's description, the

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This paper is dedicated to the memory of Willard F. Day, Jr.

present analysis began with the identification of a response class and a search for systematic relations between it and certain antecedent events. Where Leigland identified the use of mentalistic terms as a response class then identified antecedent events on the cumulative record, the present analysis simply identified his explanatory verbal behavior as the response class and identified the joint antecedent events of the subjects' verbalizations and corresponding events on the cumulative recorder. This task was easier than Leigland's inasmuch as the response class was quite easily defined and he frequently pointed out the events on the cumulative recorder to which he was referring in his explanatory statements.

His paper was read up to the section where he offers an explanation of his own behavior. While reading, the cumulative records were inspected in an attempt to identify the events that determined his explanations. For each of his explanatory statements, the events which Leigland either identified or described on the cumulative record were described in everyday language. These descriptions were searched for any commonalities and all of Leigland's explanations that were seen as determined by similar events were grouped together. This resulted in the identification of fourteen classes of events which exerted some control over Leigland's verbal behavior.

INITIAL DISCRIMINATIONS

While reading his paper, it became apparent that there were at least two sources of control over Leigland's behavior which are not present on the cumulative record. The first is his history and training as a behavior analyst. This is apparent in his use of such terms as "tacts," "post-reinforcement pause," and in such statements as, "the pigeon was responding atypically to a fixed-interval schedule." The second source of control not seen on the record is the subject's verbal behavior about events that could not be recorded on a cumulative recorder. Such events as "an extraneous noise in the experimental setting" or "the general activity level" of the pigeon did not show up on the record, but clearly exerted control over Leigland's verbal behavior.

What follows is a list of the identified sources of control over Leigland's verbal

behavior together with the specific explanations he gives which pertain to each identified source of control. For simplicity, Leigland's explanations are coded to reflect the specific mentalistic term used by each subject for which Leigland offers a functional analysis. The code refers to the subject number, the experiment number (1 or 2), and the number identifying the specific mentalistic term. Thus, S-2-1: 10, 11 reads: Subject 2, Experiment 1, terms 10 and 11.

Source of Control	Specific Explanations
I History and training as a behavior analyst.	These are throughout the text and include such terms as tacts, controlling relations, post-reinforcement pause, contingencies, occasioned, etc.
II Events reported by subjects but not on cumulative record.	
A. Reported behavior other than pecking.	S-1-1:25; S-4-1:33; S-6-2:5,11.
B. Reported events outside the experimental chamber which precede behaviors other than pecking.	S-1-1:1,2; S-2-1:7,11; S-3-1:1; S-1-2:1; S-4-2:20.
III Events on cumulative recorder	
A. Pecking	S-1-1:5,6,8.
B. Not pecking	S-6-2:4,7,8,10.
C. Food presentation	S-3-1:3.
D. Pattern of pecking and not pecking	S-1-1:17; S-2-1:4; S-4-1:1,4.
E. Consistent rate of pecking	S-5-1:6; S-6-1:32,36; S-7-1:3,6,5,9,11,15,16,20,22.
F. Increase in rate of pecking	S-3-1:4,7,9,14,15,16; S-4-1:5,16,22; S-6-1:2,5,9,15,18.
G. Consistent rate of pecking following food presentation	S-1-1:25; S-5-1:6; S-7-1:14,21; S-5-2:2; S-6-2:6,11; S-7-2:2,3,9,12.

H. Increase in rate of pecking following food presentation	S-3-1:5,13.
I. Decrease in rate of pecking following food presentation	S-1-1:10; S-2-1:3; S-4-1:6,21,25,27,30,31,35.
J. Change in rate of pecking immediately preceding food presentation	S-3-1:15.
K. Change in rate of responding appearing late in interval	S-6-1:15; S-7-1:10.
L. Relation between rate of pecking and rate of food presentations	S-2-1:4.
M. Increase in rate of pecking following change in key color	S-4-2:6; S-5-2:4; S-6-2:3,5.
N. No control identified	S-4-2:22.

### REFINED DISCRIMINATIONS

Identified sources of control for every one of Leigland's explanations is presented above in such a way that his verbal behaviors can be related to specific events on the cumulative record which occasioned their occurrence. After inspecting these initial discriminations, it occurred to me that Leigland's explanations seem to be of two types. One tended to be similar to those in the present analysis in that they were descriptions in every day language of events on the cumulative record. For example, for S-1-1:17, Leigland explains indecisive as a term used "following an alternating period of pauses and response bursts." The present description of the events on the record to which Leigland was referring is, pattern of pecking and not pecking, which is essentially identical to Leigland's. However, another type of explanation offered by Leigland is decidedly in the language of behavior analysis. Such explanations as "tacts of environmental variables. . ." (S-1-

1:1,2) and "post-reinforcement pause" (e.g., S-1-1:10) clearly fall into this category. In an attempt to determine the nature of the control over Leigland's use of behavior analytic terms, the procedure described above was repeated, this time using behavior analytic terms as the response class.

Deciding upon the response class of behavior analytic terms was not difficult. Those terms were selected which were identified as terms only a behavior analyst would use in describing events. The only questionable terms were rate and interval, which were not included inasmuch as they are generally descriptive of relevant events on the record and not strictly behavioral terms.

Upon inspecting the manuscript for behavioral terms, it became apparent that these terms were used to describe two different classes of events: the behavior of the subjects and the behavior of the pigeons (or events on the record). These were separated into two classes, and similar terms were grouped together. The following is a list of these terms along with the coded statements indicating where they occurred.

Use of Behavior Analytic Terms	Specific Explanations
I Description of subjects' behavior	
A. Mentalistic and non-mentalistic terms	S-1-2:1; S-3-2:20.
B. Tacts of environmental variables, pure tacts	S-1-1:1,2; S-1-2:1; S-3-2:20; S-4-1:22; S-6-2:11.
C. Class of verbal responses	S-4-1:1.
D. Controlling relations, terms are controlled by, terms may have been occasioned, multiplicity of control over	S-1-1:25; S-2-1:4; S-4-1:4,5; S-5-1:6; S-6-1:11; S-7-1:3; S-1-2:1; S-4-2:22.
E. Verbal behavior characteristically controlled by aversive contingencies	S-6-2:4,7,8,10.

- II Description of pigeons behavior
- A. Incompatible behaviors S-1-1:1,2; S-2-1:1.
  - B. Shift in controlling variables over responding, relative control over responding, control exerted by key S-1-1:8,10; S-4-1:1.
  - C. Operant response class selected, effects of contingencies, discriminated increase in responding S-1-2:5,13; S-6-1:11; S-4-2:6; S-4-2:6.
  - D. Response burst, short burst S-1-1:17; S-1-1:25.
  - E. Post-reinforcement-pause S-1-1:10; S-2-1:3; S-4-1:6,21,25,30,31,35.
  - F. Response rate relatively undifferentiated by FI schedules S-5-1:6.
  - G. Differential stimulus control, precise stimulus control, competing sources of control S-4-2:6,20; S-6-2:3,5,11.

### SUMMARY AND CONCLUDING REMARKS

Earlier, it was stated that the reasons for this enterprise included an investigation of the conditions that give rise to knowledge claims by a behavior analyst, and an analysis of the conditions that occasioned his use of behavior analytic terms. The enterprise was successful. It can be "seen" that what functions as an explanation for Leigland and probably other radical behaviorists, is a description of the real-world, observable events that appeared to him to control his subjects' use of mentalistic terms. These events are described in behavior analytic terms when there are appropriate terms available, and the meaning of these terms can be determined by observing the events that occasion their use.

Now, what can be said of Leigland's use of behavior analytic terms? What is most obvious is that their use is a joint function of Leigland's special history and training as a behavior analyst and the occurrence of events which occasion (can be described by) them. That is, he uses behavioral terms when they are both available and appropriate. When these terms are not available, he relies on a description of antecedent events in everyday language to explain relevant behavior. When they are available, their use presumably has been conditioned by the verbal community of behavior analysts.

It should be emphasized that it is the events which *appeared* to Leigland to control his subjects use of mentalistic verbal behavior that are given explanatory status. The term *appeared* is used for two reasons. First, no controlled experimentation was carried out to verify that the alleged controlling events actually had any controlling function over the subjects' verbal behavior. It simply appeared to Leigland that there was a controlling relation. Second, the word *appeared* seems particularly appropriate inasmuch as the methodology actually renders controlling relations visible; they appear. They appear in precisely the same sense that the controlling relations between certain environmental events and tacts or mands appeared to Skinner (1957). In the present analysis, the identified controlling relations between Leigland's verbal behavior and that of his subjects became more apparent or discriminable with repeated contact with the data. Perhaps this is the reason that Day and his colleagues called their methodology behavioral phenomenology. At this point, the most interesting question is, what are the conditions that leads one to declare that controlling relations are apparent?

The present methodology is particularly exciting for several reasons. First, it is relatively easy to do. Second, it offers an empirical epistemology; it is a functional analytic approach to understanding knowledge and meaning. Finally, as a clinical psychologist, I am particularly interested in how the methodology can be brought to bear on the analysis of verbal behavior in therapeutic contexts (Mascolo & Dougher, 1985). A functional analysis of the verbal behavior of therapists and clients can only enhance our understanding of the process of therapy and

may provide for a real understanding and useful integration of the effective aspects of all forms of therapy.

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